

Improve FM and shortwave reception with a do-it-yourself radio antenna

By Charles A. Sanders

Almost all radio listening can be improved with the use of an outside antenna. A radio antenna grabs radio wave energy out of the air, then relays it to the radio receiver which amplifies the signal to an audible level.

AM radio reception usually relies upon an antenna built into the "innards" of the radio. Although some external antennas are available for AM radios, an external antenna will not usually help to pull in weaker signals.

On the other hand, portable FM and shortwave receivers normally come equipped with a telescoping antenna. Many of these radios also have a "jack" (or socket) to attach an external antenna. Attaching an external antenna will greatly enhance the signal-gathering capabilities of these radios.

Ideally, an antenna is constructed so that it can be tuned to the particular frequency it is receiving (or transmitting on). However, for general listening, a simple "long-wire" antenna can

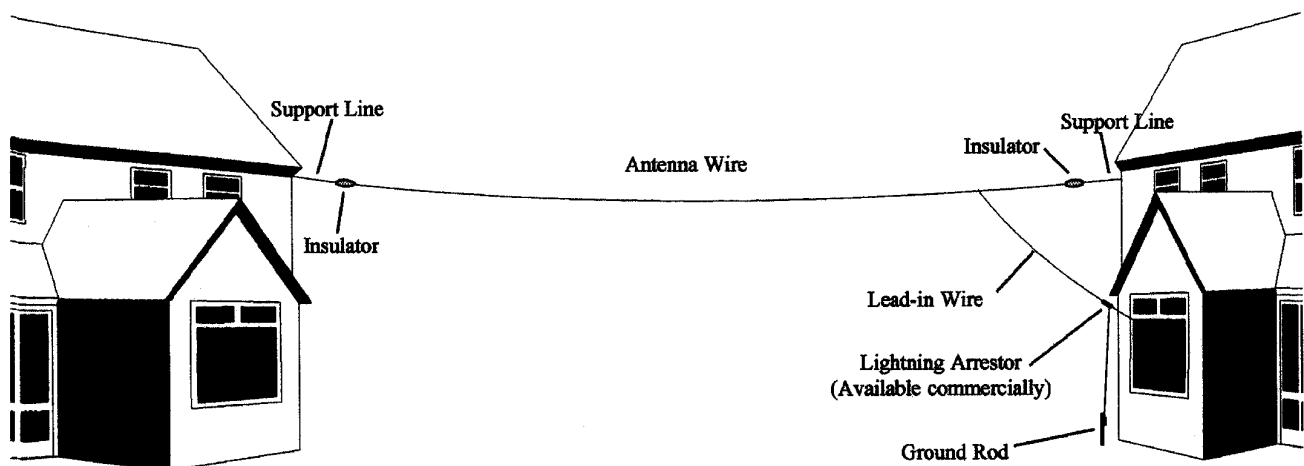
be made easily, quickly, and cheaply for just about any FM or shortwave receiver. The antenna described here will pull in a lot of distant stations that were either too faint and scratchy to listen to, or even completely inaudible.

For general listening on FM and shortwave, the length of the antenna itself is not critical. It may be made as long or as short as space will permit. It may be suspended from an outside windowsill to a tree or building by attaching it between two insulators, or merely laid around the baseboard of the room. I have used a length of flat TV lead-in wire as a makeshift shortwave antenna. I just attached it to the terminals on my old Hallicrafter receiver and laid it around the room along the walls. It worked pretty well. I have also seen an effective antenna made by suspending a light-gauge insulated wire with thumbtacks along the walls of a room near the ceiling. These types of "quicky" antennas are especially handy if you live in an apartment, where neighbors might

complain, or in other situations where an outside antenna is undesirable.

In a pinch, an unusual makeshift antenna can even be made by making up a length of insulated wire with an antenna plug on one end and about three or four inches of bare wire on the other. Insert the plug into the antenna jack on your radio and wrap the bare wire around one of the strands of barbed wire fencing on your place. You will instantly have an antenna considerably longer than any you can construct—a real "long-wire" antenna.

As you can see, the antenna arrangement can be made very cheaply and easily. The illustration depicts the construction of a more permanent long-wire antenna suspended between two insulators. Commercial glass insulators are readily available and inexpensive, or you can make effective substitutes by using a couple of pieces of PVC pipe from the scrap pile. The important thing is to separate the antenna wire itself from the support line.



A simple long-wire antenna setup

Copper wire makes the best antenna. The wire used for both the antenna and the lead-in can be the same size, usually 12, 14 or 16 gauge. Try not to use solid-core wire. The long-term effects of wind and weather can take their toll on lighter wires, and stranded or braided wire will provide the best durability.

Another important item is to be sure to use a lead-in wire that can be attached to your radio. Visit the local radio supply store and purchase a plug which will fit the antenna jack of your radio. These plugs are inexpensive and easy to use.

Since the lead-in wire will likely be run over a windowsill or otherwise come into contact with other surfaces, it must be made of insulated wire. It cannot come into contact with anything which will absorb the energy of the radio signals. If you use a separate antenna wire and lead-in wire, be sure to carefully cut away any insulating covering, then twist the two together, bare wire to bare wire. It is best to then solder the connection and securely wrap it with weatherproof electrician's tape. In a pinch, you can get by without soldering the wires together.

As seen in the illustration, a short piece of support line is anchored near the site where the radio is located (in most cases, the outside wall of the home). An insulator is then secured to the free end of the short line. Next, the antenna wire is secured to the insulator. You may either secure the end of the antenna wire and attach the lead-in wire later, or simply provide one piece of wire long enough to serve as both the antenna and lead-in wire. Using one piece of wire will eliminate the need to solder or wrap the lead-in wire to the antenna wire. In either case, the wire is attached to the insulator to separate the antenna wire from the support line.

Out on the far end of the antenna wire, attach another insulator. Then attach another piece of support line to the free end of the insulator. Run the support line to a tree limb, pole,

another building, or other support. The whole assembly does not need to be suspended too tightly, but hang it high enough so it's out of the way. In fact, the higher and longer the antenna is, the better the reception will be.

Be sure to run a ground wire, routed through a lightning arrestor, from this suspended antenna. It is obvious that in the event of a lightning strike, it is better for the million-some-odd volts of electricity to go to ground than to come leaping out of your radio. Use a six- to eight-foot copper or brass rod and drive it in a good five to seven feet into the ground. Firmly clamp one end of the ground wire to the rod and secure the other end to the lightning arrestor. It in turn is connected to the lead-in wire. (The lightning arrestor *won't* conduct small currents to your grounding rod, but it *will* ground out a lightning strike.) This arrangement will provide some cheap insurance and considerable peace of mind.

When selecting a site for your outside antenna, remember that the antenna picks up best those signals which come in at a right angle to its length. In fact, it is a relatively simple matter to construct two of the long-wire antennas described in this article and place them at right angles to each other. If you do this, you can connect both antennas to your lead-in wire, but you may find some "clutter"—that is, weak stations crowding in on the station you're trying to hear. If that's a problem, you can add a switch to the setup, so you can switch from one antenna to the other.

It is also important to place the antenna away from sources of electrical interference. That may include power lines, transformers, thermostats, TV sets, fluorescent lights, electric motors, electric fence chargers, and even passing automobile traffic. Rheostat switches such as those used on household light dimmer switches will also wreak havoc with radio signals if close by. Electrical storms will also disrupt your recep-

tion. And remember, when erecting your antenna, **never cross over or under power lines** with it.

If you want to enhance your radio set's reception, consider trying an external radio antenna. Whatever your location, I think your set's performance will be improved. Δ